

# ATM Traffic Management: Unresolved Issues

Raj Jain

Raj Jain is now at  
Washington University in Saint Louis  
Jain@cse.wustl.edu  
<http://www.cse.wustl.edu/~jain/>



- q Real Time ABR
- q Multicast
- q Virtual Source/Virtual Destination
- q Connection Admission Control

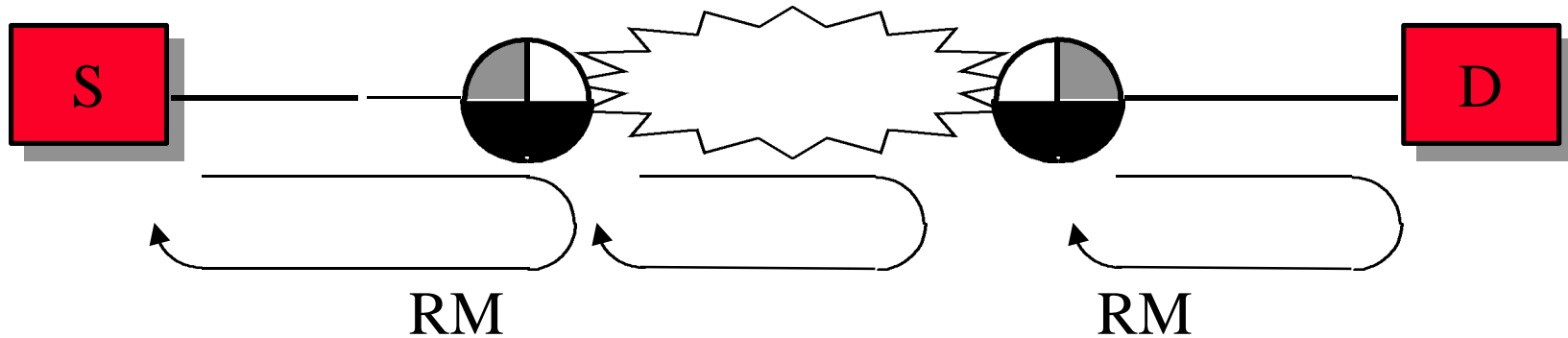
## Real-Time ABR

- q Compressed video is VBR
- q VBR is subject to connection denial if network congested
- q Compression parameters can be adjusted dynamically
- q In situations, where reduced service is preferable over connection denial, such as in tactical environments, Video over ABR is preferable over no Video.
- q ABR divides the available bandwidth fairly among contending connections
- q By proper control, ABR can be designed to reduce delay.  
⇒ Real-time ABR

# Multicasting

- q Multicasting is important for video applications
- q ATM forum approach to multicast is source oriented  
Source decides who joins the multicast
- q IETF's approach is receiver oriented.  
Receivers decide which multicast to listen to.  
Not good for tactical environments.
- q In ATM Forum approach, all receivers have the same  
quality of service  
Bad condition on one branch affect the whole broadcast  
tree
- q Proper filtering of traffic and different quality of service at  
different branches will help distributed video to many  
more receivers

## Virtual Source/Virtual Destination



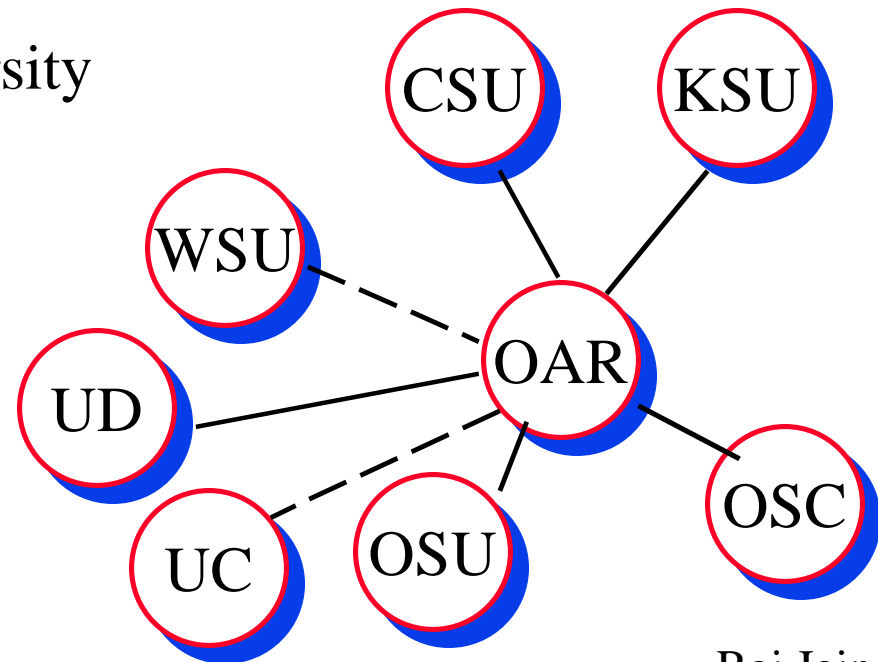
- q How is the control passed from a virtual source to previous virtual destination?
- q What is effect of control loops of very different delays

# Connection Admission Control

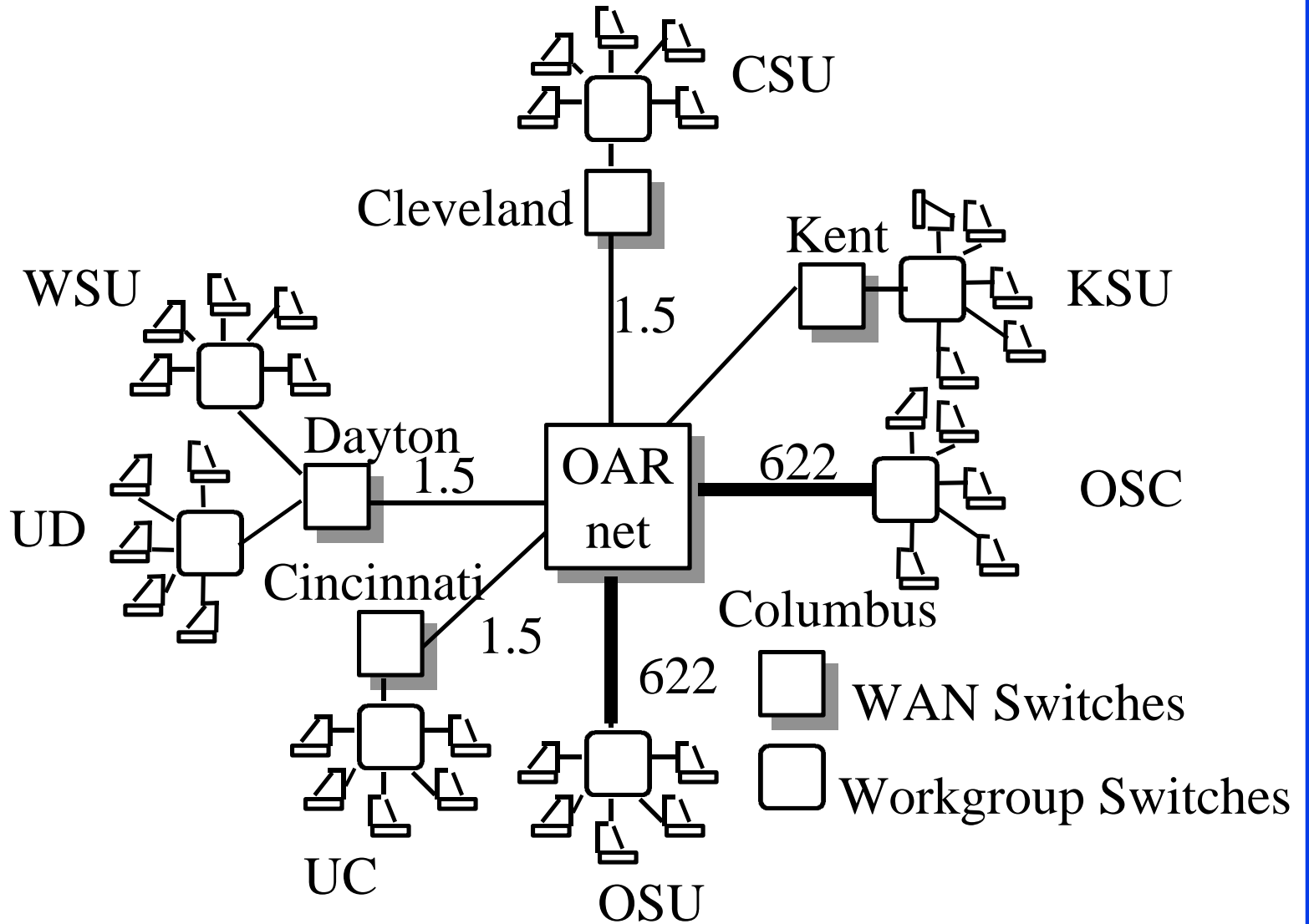
- q What should the sources demand to get a desired loss rate?
- q What should the switches ensure to meet a given guarantee?
- q Should a switch accept all ABR connection requests?
- q Number of ABR connections on a link and the distances the connections are going to affect the performance of a new VC.

# OCARNet

- q Ohio Computing and Communications Research Network
- q Six (soon eight) Institution consortium lead by OSU
  - Ohio State University
  - Ohio Super Computer Center
  - OARnet
  - Cleveland State University
  - Kent State University
  - University of Dayton
  - *University of Cincinnati*
  - *Wright State Univer*

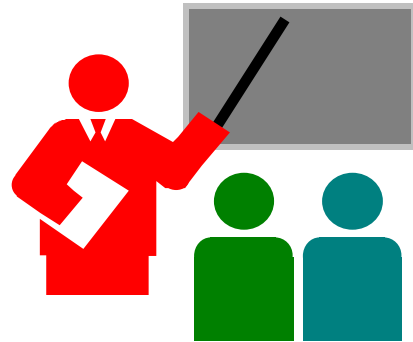


# OCArnet





# Summary



- q In tactical environment, it may be better to send a lower quality video rather than no video if network is congested  
Need real-time ABR
- q Real-time ABR is feasible with proper queue control
- q Multicasting to allow receivers of different QoS requirements
- q The couplings between various control loops of a VS/VD affects the end-to-end performance
- q Issues for CAC of ABR need to be studied.